REMARKS

Claims 37-41 and 45 are amended. Claims 37-53 are pending in the application.

Claims 37-53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of the following references: Segal, U.S. Patent No. 5,513,512; ASM Handbook Vol. 4, "Normalizing of Steel"; ASM Handbook Vol. 4, "Stress-Relief Heat Treating of Steel"; and Worcester, U.S. Patent No. 5,194,101. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Each of claims 37-53 are allowable over the various cited combinations of Segal, "Stress Relief", "Normalizing"; and Worcester for at least the reasons that the references, individually or as combined, fail to disclose or suggest each and every limitation in any of those claims and fail to provide motivation or a basis for a reasonable expectation of success for the claimed features.

As amended, each of independent claims 37, 38, 39 and 41 recite performing a preliminary treatment comprising subjecting a cast non-ferrous based alloy to at least one of homogenizing, hot-forging, and solutionizing and subsequently subjecting the alloy to equal channel angular extrusion (ECAE). Segal discloses utilizing various routes of ECAE to produce specific grain textures and structures. Segal does not disclose or suggest the combined preliminary treatment and ECAE as recited in independent claims 37, 38, 39 and 41. "Normalizing of Steel" discloses treating an iron based material by heating above the upper critical line of the iron-iron carbide phase diagram to produce a homogenous

austenitic phase. "Normalizing of Steel" does not disclose or suggest a cast material comprising a non-ferrous alloy or the recited subjecting a cast material to one or more of homogenizing, hot forging, and solutionizing. Further, "Normalizing" does not disclose or suggest ECAE.

"Stress Relief" discloses specific heat treating for uniformly heat treating at a temperature below critical temperatures for steel. "Stress Relief" does not disclose or suggest the claim 37 recited cast material comprising a non-ferrous based alloy. Additionally, stress relief does not disclose or suggest the recited heat treating a non-ferrous based alloy utilizing at least one of homogenizing, hot forging, and solutionizing. Further, "Stress Relief" does not disclose or suggest the recited subjecting a non-ferrous alloy to ECAE. Worcester discloses utilizing cold rolling and hot rolling of Zircaloy-4 material including intermediate annealing at a temperature not greater than 520° C between cold rolling passes. Worcester does not disclose or suggest the claims 37, 38, 39, and 41 recited performing a preliminary treatment comprising homogenizing, hot forging and/or solutionizing prior to ECAE.

As combined, the various routes of ECAE disclosed by Segal, the specific heat treatment procedures for treatment of steel disclosed in "Normalizing of Steel" and "Stress Relief", and the processing of Zircaloy-4 utilizing cold rolling, hot rolling, and intermediate annealing between rolling passes disclosed by Worcester does not teach or suggest the claims 37-39 and 41 recited subjecting of a non-ferrous alloy to a preliminary treatment comprising at least one of homogenizing, hot forging, and solutionizing prior to performing ECAE. Further, there is no motivation or reasonable basis of success within the various cited combinations of references for the recited method comprising preliminary treatment of

a non-ferrous alloy followed by ECAE. Accordingly, independent claims 37, 38, 39 and 41 are not rendered obvious by the various cited combinations of Segal, "Stress Relief", "Normalizing of Steel", and Worcester and are allowable over these references.

As amended, independent claim 40 recites processing a non-ferrous based alloy utilizing ECAE, the process including performing at least one ECAE pass, intermediate annealing the alloy and subsequently performing at least one additional pass. Not one of Segal, "Stress Relief", and "Normalizing of Steel" disclose or suggest the claim 40 recited intermediate annealing of a non-ferrous based alloy. Additionally, not one of these three references discloses or suggests intermediate annealing between ECAE passes. As discussed above, Worcester discloses performing an intermediate anneal between rolling passes. The intermediate anneal between rolling passes as disclosed by Worcester does not disclose or suggest the claim 40 recited combination of intermediate annealing with ECAE. As combined, the utilization of specific ECAE routes as disclosed in Segal combined with the specific heat treatments for steel as disclosed in "Stress Relief" and "Normalizing of steel" and the intermediate anneal between rolling steps as disclosed in Worcester does not suggest the claim 40 recited intermediate annealing between ECAE passes for processing a cast material comprising a non-ferrous based alloy. Accordingly, independent claim 40 is not rendered obvious by the various cited combinations of Segal, "Stress Relief", "Normalizing of Steel", and Worcester and claim 40 is allowable over these references.

Claim 45 is amended to correct a typographical error. Dependent claims 42-53 are allowable over the various cited combinations of Segal, "Stress Relief", "Normalizing of Steel", and Worcester for at least the reason that they depend from corresponding

allowable base claims 37-41.

For the reasons discussed above, claims 37-53 are allowable. Accordingly, applicant respectfully requests formal allowance of pending claims 37-53 in the Examiner's next action.

Respectfully submitted,

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